Trend Study 13A-7-99

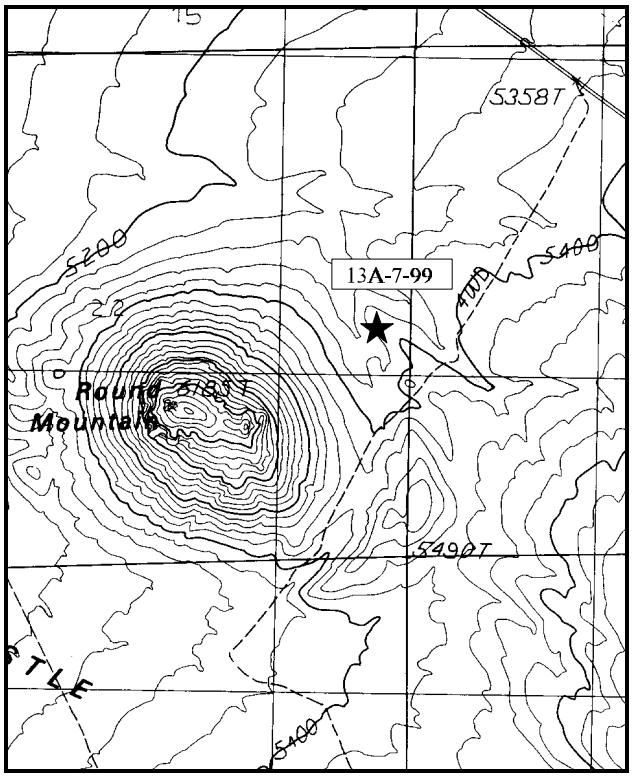
Study site name: Round Mountain . Range type: Blackbrush .

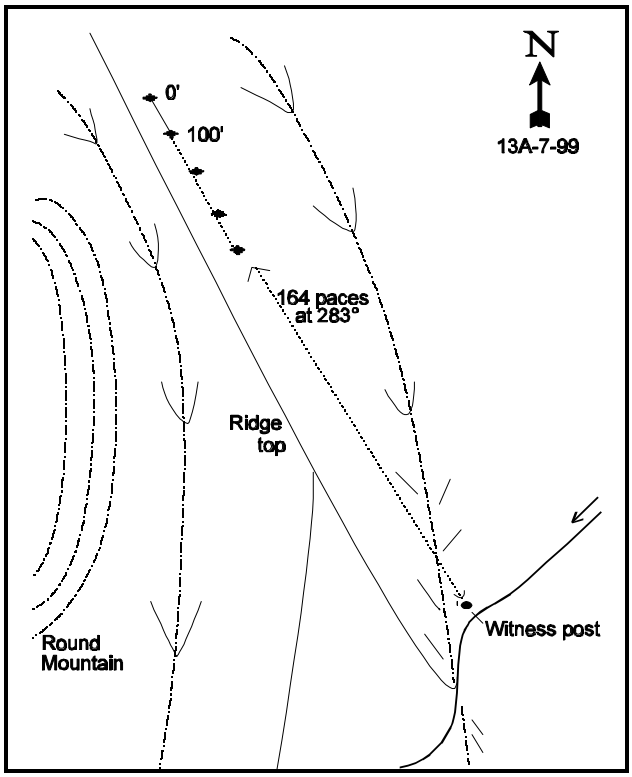
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Travel 6.8 miles up the Castle Valley Road (LaSal Mountain Loop Road) from SR 128 along the Colorado River. Turn onto a rough dirt road heading south towards Round Mountain. Travel 0.55 miles to just before the road drops into a deep draw. There is a witness post (4' green fencepost) on the right side of the road. From here, walk 164 paces west northwest (approximately 283°) down and across the draw to the top of a sage-blackbrush ridge. The 0-foot baseline stake is a short fencepost marked with a red browse tag #7837.





Map Name: Warner Lake Diagrammatic Sketch

Township 25S , Range 23E , Section 22 UTM 4275165.472 N, 643305.147 E

DISCUSSION

Trend Study No. 13A-7 (33-7)

The Round Mountain study samples a blackbrush-sagebrush type near the center of Castle Valley, just east of Round Mountain, a prominent landmark. Castle Valley, on the northeast end of the LaSal Mountain range, is considered critical winter range for deer. Pellet group transects on the study area indicated use to be 2 elk days use/acre (5 edu/ha) and 78 deer days use/acre (193 ddu/ha). Much of the land in lower Castle Valley is managed by the Utah Division of State Lands and Forestry which allows winter use by cattle on this key wintering area. The study is located on a small ridge within the rolling foothills below Round Mountain. The elevation is 5,400 feet with a generally western exposure. Drainage of the area is northwest through Castle Valley to the Colorado River.

The soil is very rocky, both on the surface and below. It is a moderately shallow, reddish sandy clay loam soil with an effective rooting depth of about 10 inches. It is mildly to moderately alkaline with a pH of 7.8. The most obvious limiting feature of the site is that the soil temperature at 10 inches is almost 70°F. This temperature would make it advantageous for annuals to dominate the herbaceous understory. Although it appears to be highly erodible, there is little evidence of current erosion. However, erosion has historically been a problem with large amounts of rock cover present. Current rock-pavement totals are quite high at almost 50%.

Shrubs provide the only forage available to deer in the winter. The key species, but not the most dominant, is Wyoming big sagebrush. The shallow-soiled ridge tops also support good populations of blackbrush. Wyoming big sagebrush made up 34% of the browse cover in 1994, now it only makes up 13% of the browse cover. The blackbrush, which is more adapted to the high soil temperatures and drought, made up 46% of the browse cover in 1994, now it makes up 52% of the browse cover. Together on average, these two species contribute 57% of the total vegetative cover. However, total vegetative cover is less than 30%. Density plot information on sagebrush in 1987 appeared to indicate a stable population even when the plants showed heavy browsing use (64% of them at that time). In 1994, only 3% showed heavy use, now 56% show heavy use. Percent decadence has been above 50% since 1994. Since 1994, more than 40% of the decadent plants have been classified as dying. This population is not displaying traits of a stable population. From 1994 to 1999, the population has decreased by 26%. With a reproductive potential of zero and the percent young age class at only 1%, there are no replacements coming in the near future. The blackbrush show moderate to heavy use. Their population has also declined by 15% since 1994. This is a much better trend than that for Wyoming big sagebrush which obviously was more effected by the extended drought and high soil temperatures than the blackbrush. However, the trend for browse on this site is still down. Juniper and a few pinyon trees are found in the washes and slopes of Round Mountain.

Herbaceous vegetation (grasses and forbs) are not an important component of this community for on average they only make up 22% of the total vegetative cover. Over 96% of the grass cover is contributed by annual grasses, mostly cheatgrass. Perennial grasses are few. Mutton bluegrass is found mostly growing in the protection of shrub crowns. Total forb cover in 1999 was less than 1%. There were 14 species of forbs found in 1994, now only 8 can be found, of which only 3 species are perennial.

The rocky nature of the site explains why there is almost 50% cover for rock and pavement. Percent bare ground was fairly low, but only because of the high cover value for rock and pavement. The proportion of the plant cover provided by the herbaceous understory is very low leaving the soil unprotected from high intensity summer storms.

1994 TREND ASSESSMENT

The trend for soils would be slightly down because of the loss of much of the litter cover down to only 20% and percent bare ground has increased to 24%. The browse trend is down for Wyoming big sagebrush which

is the primary key species for this site. More than 25% of the population is dead, a ratio of almost one in three plants. Biotic potential is zero, and the percentage of young plants has gone from 44% to only 3%. The trend for the herbaceous understory shows increased nested frequency values, but over 90% of the cover is contributed by annual species. Trend is down for the herbaceous understory.

TREND ASSESSMENT
soil - slightly down
browse - down
herbaceous understory - down

1999 TREND ASSESSMENT

The trend for soils would be slightly down because of continuing increase in percent rock cover. The browse trend is down for both Wyoming big sagebrush and blackbrush which are the primary key species for this site. There have been losses in the population for both sagebrush and blackbrush, 26% and 15% respectively. More than one-third of the sagebrush population is dead. Biotic potential is zero, and the percentage of young plants is only 1%. The trend for the herbaceous understory shows increased nested frequency values, but over 90% of the cover is contributed by annual species. Trend is also down for the herbaceous understory.

TREND ASSESSMENT
soil - slightly down
browse - down
herbaceous understory - down

HERBACEOUS TRENDS --
Herd unit 13A, Study no: 7

Type	Species	Nested Frequency '87	'94	'99	Quadrat Frequency '87	'94	'99	Average Cover % '94	'99
G	Bromus tectorum (a)	-	$_{a}$214	$_{b}$327	-	72	96	3.00	6.42
G	Poa fendleriana	-	3	4	-	3	3	.01	.04
G	Sitanion hystrix	-	$_{b}$4	$_{a}$-	-	3	-	.04	-
G	Vulpia octoflora (a)	-	$_{b}$145	$_{a}$75	-	54	30	.32	.22
Total for Annual Grasses		0	359	402	0	126	126	3.31	6.65
Total for Perennial Grasses		0	7	4	0	6	3	0.05	0.04
Total for Grasses		0	366	406	0	132	129	3.37	6.69
F	Arabis spp.	14	3	1	6	2	1	.01	.00
F	Astragalus moencopensis	-	1	-	-	1	-	.00	-
F	Astragalus spp.	$_{a}$6	$_{b}$71	$_{a}$10	3	34	6	.17	.03
F	Castilleja chromosa	-	2	-	-	1	-	.01	-
F	Descurainia pinnata (a)	-	$_{b}$25	$_{a}$-	-	10	-	.05	-
F	Draba reptans (a)	-	$_{b}$190	$_{a}$10	-	80	5	.42	.02
F	Eriogonum cernuum (a)	-	2	-	-	1	-	.00	-
F	Erigeron pumilus	1	-	-	1	-	-	-	-
F	Gilia spp. (a)	-	$_{b}$106	$_{a}$10	-	40	5	.20	.05

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'87	'94	'99	'87	'94	'99	'94	'99
F	Holosteum umbellatum (a)	-	$_{a}$-	$_{b}$11	-	-	4	-	.02
F	Lappula occidentalis (a)	-	$_{b}$11	$_{a}$-	-	5	-	.02	-
F	Penstemon pachyphyllus	3	-	-	1	-	-	-	-
F	Physaria spp.	-	4	-	-	2	-	.03	-
F	Plantago patagonica (a)	-	$_{b}$20	$_{a}$11	-	9	4	.04	.02
F	Senecio multilobatus	-	20	8	-	10	5	.67	.05
F	Sisymbrium altissimum (a)	-	9	3	-	4	2	.02	.01
F	Streptanthus cordatus	-	15	-	-	7	-	.43	-
Total for Annual Forbs		0	363	45	0	149	20	0.77	0.12
Total for Perennial Forbs		24	116	19	11	57	12	1.34	0.08
Total for Forbs		24	479	64	11	206	32	2.11	0.21

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 13A, Study no: 7

Type	Species	Strip Frequency		Average Cover %	
		'94	'99	'94	'99
B	Artemisia tridentata vaseyana	0	2	-	-
B	Artemisia tridentata wyomingensis	68	50	7.01	3.01
B	Atriplex canescens	0	0	-	-
B	Coleogyne ramosissima	64	65	9.59	11.75
B	Ephedra viridis	2	1	.03	.15
B	Gutierrezia sarothrae	50	57	.95	1.16
B	Juniperus osteosperma	0	3	3.08	6.59
B	Opuntia spp.	0	1	-	-
B	Pinus edulis	-	-	-	-
Total for Browse		184	179	20.68	22.65

CANOPY COVER --
Herd unit 13A, Study no: 7

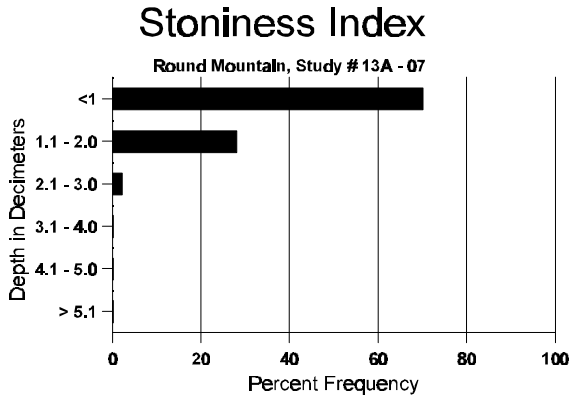
Species	Percent Cover '99
Juniperus osteosperma	4

BASIC COVER --
Herd unit 13A, Study no: 7

Cover Type	Nested Frequency '94	Nested Frequency '99	Average Cover % '87	Average Cover % '94	Average Cover % '99
Vegetation	324	344	8.25	22.44	29.63
Rock	361	298	32.00	30.60	23.46
Pavement	360	325	16.75	10.05	25.93
Litter	372	338	29.50	20.06	23.24
Cryptogams	121	71	.25	1.23	1.47
Bare Ground	359	253	13.25	24.26	8.07

SOIL ANALYSIS DATA --
Herd Unit 13A, Study # 07, Study Name: Round Mountain

Effective rooting depth (cm)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.6	69.2 (10.8)	7.8	58.9	19.8	21.3	1.9	60.4	48.0	0.4



PELLET GROUP DATA --
Herd unit 13A, Study no: 7

Type	Quadrat Frequency '94	Quadrat Frequency '99
Rabbit	8	9
Elk	-	3
Deer	49	40

Pellet Transect Days Use/Acre (ha) '99
N/A
2 (5)
78 (193)

BROWSE CHARACTERISTICS --
Herd unit 13A, Study no: 7

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	2	-	-	-	-	2	-	-	-	40	-	-	2
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	4	-	-	-	-	-	-	-	-	-	-	4	80			4
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	100%	00%	67%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		0%
'94	0			0%
'99	120			67%

Artemisia tridentata wyomingensis																		
S	87	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	87	1	10	21	-	-	-	-	-	-	32	-	-	-	2133			32
	94	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	99	-	-	-	-	1	-	-	-	-	1	-	-	-	20			1
M	87	-	5	19	-	-	-	-	-	-	24	-	-	-	1600	16	27	24
	94	26	9	1	-	-	-	-	-	-	31	-	5	-	720	18	36	36
	99	-	9	12	-	6	11	-	-	-	38	-	-	-	760	18	29	38
D	87	1	9	6	-	-	-	-	-	-	14	-	1	1	1066			16
	94	43	19	2	2	2	-	-	-	-	36	-	4	28	1360			68
	99	1	9	8	4	2	13	3	-	-	24	-	-	16	800			40
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	800			40
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	840			42

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	33%	64%	03%	-55%
'94	28%	03%	35%	-26%
'99	34%	56%	20%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	4799	Dec:	22%
'94	2140		64%
'99	1580		51%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Atriplex canescens																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	0	27	43	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	0	Dec:	-
	'94	0		-
	'99	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Coleogyne ramosissima																		
S	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	87	6	1	4	-	-	-	-	-	-	11	-	-	-	733			11
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	1	1	-	-	-	-	-	-	-	2	-	-	-	40			2
M	87	1	4	10	-	-	-	-	-	-	15	-	-	-	1000	12	16	15
	94	141	27	1	-	11	-	-	-	-	159	-	21	-	3600	13	26	180
	99	81	40	12	37	-	-	-	-	-	170	-	-	-	3400	16	30	170
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	18	-	-	4	3	-	-	-	-	25	-	-	-	500			25
	99	1	-	-	1	-	-	1	-	-	2	-	-	1	60			3
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	19%	54%	00%	+58%
'94	20%	.48%	10%	-15%
'99	23%	07%	.57%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	1733	Dec:	0%
	'94	4120		12%
	'99	3500		2%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ephedra viridis																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	99	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	1	-	-	-	-	-	-	1	-	-	-	66	4	2	1
	94	-	1	-	-	-	-	-	-	-	1	-	-	-	20	19	22	1
	99	-	-	1	-	-	-	-	-	-	1	-	-	-	20	25	31	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	100%	00%	-39%
'94	50%	00%	00%	+50%
'99	00%	25%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	-
	'94	40		-
	'99	80		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	87	6	-	-	-	-	-	-	-	-	6	-	-	-	400			6
	94	122	19	-	3	-	-	-	-	-	144	-	-	-	2880			144
	99	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
Y	87	24	2	7	-	-	-	-	-	-	33	-	-	-	2200			33
	94	31	-	-	-	-	-	-	-	-	31	-	-	-	620			31
	99	42	-	-	-	-	-	-	-	-	42	-	-	-	840			42
M	87	35	2	-	-	-	-	-	-	-	37	-	-	-	2466	8	6	37
	94	67	-	-	1	-	-	-	-	-	68	-	-	-	1360	9	11	68
	99	129	-	-	1	-	-	-	-	-	130	-	-	-	2600	7	10	130
D	87	2	-	-	-	-	-	-	-	-	-	-	-	2	133			2
	94	11	1	-	-	-	-	-	-	-	10	-	-	2	240			12
	99	6	-	-	-	-	-	-	-	-	3	-	-	3	120			6
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19
	99	-	-	-	-	-	-	-	-	-	-	-	-	-	340			17

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	06%	10%	03%	-54%
'94	.90%	00%	02%	+38%
'99	00%	00%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	4799	Dec:		3%
'94	2220			11%
'99	3560			3%

Juniperus osteosperma																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	99	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'94	00%	00%	00%	
'99	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	66	Dec:		-
'94	0			-
'99	60			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	99	1	-	-	-	-	-	-	-	-	1	-	-	-	20	12	7	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'94	00%	00%	00%
'99	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:	-
'94	0		-
'99	20		-